

## Claims

### What is claimed:

1. A network management station, comprising:
  - a processor;
  - a memory coupled to the processor; and
  - program instructions provided to the memory and executable by the processor to:
    - transmit a network management message to a device connected to the network management station over a network;
    - collect response information from the device based on the network management message;
    - receive unsolicited information from the device; and
    - analyze the response information and the unsolicited information according to a set of heuristics to provide a health measurement of the device.
2. The station of claim 1, further including program instructions that execute to compare device processor utilization, device memory utilization, local area network (LAN) utilization, errors, and trap information with one or more thresholds as parameters to the set of heuristics.
3. The station of claim 1, wherein the set of heuristics include as parameters; processor utilization, memory utilization, LAN utilization, statistics including discards, cyclical redundancy checking (CRC) and frame check sequence (FCS) errors and number of broadcast, and traps, received as both solicited and unsolicited messages from the device.
4. The station of claim 1, further including program instructions that execute to analyze unsolicited messages initiated from the device to a management program, the unsolicited messages selected from the group of:
  - messages reporting successful events;
  - messages reporting a traffic threshold; and
  - messages reporting a non-functioning component on the device.

5. The station of claim 1, further including program instructions that execute to collectively analyze all of the information, both solicited and unsolicited, in order to formulate a health measurement for the device and for the network.
6. The station of claim 1, further including program instructions that execute to assign pre-selected weight values to the collected and received information as part of an applied heuristic and to use the weight values to provide the health measurement.
7. The station of claim 6, further including program instructions that execute to initiate network actions, based on the health measurement, to avoid potential issues with the device and the network.
8. The station of claim 1, further including program instruction that execute to implement different weight values to solicited and unsolicited information as parameters to the set of heuristics as suited to a particular type of network device.
9. The station of claim 1, further including program instruction that execute to implement different weight values to solicited and unsolicited information as parameters to the set of heuristics as suited to a particular type of network.
10. The station of claim 1, wherein the device and the station are connected over a local area network (LAN).
11. The station of claim 1, wherein the device and the station are connected over a wide area network (WAN).
12. A network management station, comprising:
  - a processor;
  - a memory coupled to the processor; and

program instructions provided to the memory and executable by the processor to:

poll a device, connected to the station over a network, with network management messages;

receive processor utilization, memory utilization, link up/down status, trap, buffer utilization, discard and error information in response to the polling and as unsolicited information initiated by and transmitted from the device; and

apply heuristics to the received information from the polling and unsolicited transmissions collectively to determine a health of the device.

13. The station of claim 12, further including program instructions which execute to display a visual indicator of the health of the device.

14. The station of claim 13, further including program instructions which execute to display additional detail report information upon a selection of the visual indicator.

15. The station of claim 12, further including program instructions that execute to register, as a parameter to the applied heuristics, that the data traffic through a port of the device is being under utilized.

16. The station of claim 15, further including program instructions that execute to register, as a parameter to the applied heuristics, that the data traffic through a port on another network device is overburdened.

17. The station of claim 16, further including program instructions that execute to initiate an action based on the determined health of device in order to avoid a problem on the device and the network.

18. A method for network and network device monitoring, comprising:  
transmitting a network management message to a device;

collecting response information from the device based on the network management message;

receiving unsolicited information from the device; and

analyzing the response information and the unsolicited information according to a set of heuristics to provide a health measurement for the device.

19. The method of claim 18, wherein the method further includes transmitting an SNMP message to the device.

20. The method of claim 19, wherein the method further includes receiving return information contained in a management information base (MIB) of the device.

21. The method of claim 18, wherein the method further includes transmitting an ICMP ping to the device.

22. The method of claim 18, wherein the method further includes receiving information using a telnet protocol.

23. The method of claim 18, wherein the method further includes receiving traps from the device.

24. The method of claim 18, wherein receiving unsolicited information includes unsolicited information relating to:

processor utilization;

memory utilization;

local area network utilization; and

errors.

25. The method of claim 18, wherein receiving unsolicited information from the device includes receiving messages initiated from the device to a management program, including messages selected from the group of:

messages reporting successful events;

messages reporting a traffic threshold; and  
messages reporting a non-functioning component on the device.

26. The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that a packet of data has been successfully sent from a port on the device.
27. The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that the device is over burdened with traffic and may crash.
28. The method of claim 18, wherein the method further includes receiving a message, initiated from the device to a management program, which reports that a port on the device is not functioning.
29. The method of claim 18, wherein analyzing according to a set of heuristics includes a heuristic having parameters selected from the group of:
  - a processor utilization;
  - a memory utilization;
  - a link up/down status;
  - a trap receipt;
  - a buffer utilization;
  - a discard receipt;
  - a CRC statistic; and
  - a FCS statistic.
30. A method for network and network device monitoring, comprising:
  - polling a device with network management messages;
  - receiving processor utilization, memory utilization, link up/down status, trap, buffer utilization, and error information in response to the polling and as unsolicited information initiated by and transmitted from the device; and

applying heuristics to the received information from the polling and unsolicited transmissions collectively to determine a health of the device and the network.

31. The method of claim 30, wherein the method further includes displaying a visual indicator of the determined health.

32. The method of claim 31, wherein the method further includes accessing additional report information by selecting the visual indicator.

33. A computer readable medium having instructions for causing a device to perform a method, comprising:

transmitting a network management message to a device;  
collecting response information from the device based on the network management message;  
receiving unsolicited information from the device; and  
analyzing the response information and the unsolicited information according to a set of heuristics to provide a health measurement of the device.

34. A network management station, comprising:

a processor;  
a memory coupled to the processor;  
means for receiving solicited and unsolicited information from a network device, the unsolicited information initiated by and transmitted from the device, the information including processor utilization, memory utilization, link up/down status, trap, buffer utilization, and error information; and  
means for analyzing the received information collectively to provide a health measurement of the device.

35. The station of claim 34, wherein the means for receiving solicited information includes executing instructions to send a simple network management protocol (SNMP) query to the device.

36. The station of claim 34, wherein the means for receiving unsolicited information initiated by and transmitted from the device includes executing program instructions to record the unsolicited information and to apply the unsolicited information as parameters in a heuristic analysis.
37. The station of claim 34, wherein the heuristic analysis includes program instructions that execute to assign pre-selected weight values to the solicited and unsolicited information to provide the health measurement.
38. The station of claim 37, further including program instructions that execute to initiate network actions based on the health measurement.
39. The station of claim 38, further including program instruction that execute selectively modify one or more parameters in the heuristic analysis as suited to a particular type of network work and a particular type of network device.